Release notes for ENDF/B Development n-038_Sr_087 evaluation

April 26, 2017

- **checkr** Warnings:

  1. A previous error halted parsing of the current section
     MAT=3834, MF= 1, MT=451 (1): Parsing stopped

     ```
     ERROR(S) FOUND IN MAT=3834, MF= 1, MT=451
         SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER     232 TO     273
     ```

- **checkr** Errors:

  1. A variable is outside the allowed ENDF range
     MAT=3834, MF= 1, MT=451 (0): Variable range

     ```
     ERROR(S) FOUND IN MAT=3834, MF= 1, MT=451
         MOD =    1 OUT OF RANGE    0 -    0          RECORD NUMBER    232
     ```

  2. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=3834, MF= 2, MT=151 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=3834, MF= 2, MT=151
         SECTION  2/151 NOT IN DIRECTORY          RECORD NUMBER    275
     ```

  3. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=3834, MF= 3, MT= 1 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=3834, MF= 3, MT=  1
         SECTION  3/  1 NOT IN DIRECTORY          RECORD NUMBER    548
     ```

  4. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=3834, MF= 3, MT= 2 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=3834, MF= 3, MT=  2
         SECTION  3/  2 NOT IN DIRECTORY          RECORD NUMBER    573
     ```

  5. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=3834, MF= 3, MT= 4 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=3834, MF= 3, MT=  4
         SECTION  3/  4 NOT IN DIRECTORY          RECORD NUMBER    598
     ```

  6. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=3834, MF= 3, MT= 16 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=3834, MF= 3, MT= 16
         SECTION  3/ 16 NOT IN DIRECTORY          RECORD NUMBER    613
     ```

  7. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=3834, MF= 3, MT= 22 (0): Directory (b)

1

```
      ERROR(S) FOUND IN MAT=3834, MF= 3, MT= 22
         SECTION  3/ 22 NOT IN DIRECTORY                 RECORD NUMBER      623
```

8. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=3834, MF= 3, MT= 28 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 3, MT= 28
         SECTION  3/ 28 NOT IN DIRECTORY                 RECORD NUMBER      634
```

9. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=3834, MF= 3, MT= 32 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 3, MT= 32
         SECTION  3/ 32 NOT IN DIRECTORY                 RECORD NUMBER      644
```

10. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT= 51 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 3, MT= 51
         SECTION  3/ 51 NOT IN DIRECTORY                 RECORD NUMBER      650
```

11. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT= 52 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 3, MT= 52
         SECTION  3/ 52 NOT IN DIRECTORY                 RECORD NUMBER      665
```

12. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT= 53 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 3, MT= 53
         SECTION  3/ 53 NOT IN DIRECTORY                 RECORD NUMBER      678
```

13. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT= 54 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 3, MT= 54
         SECTION  3/ 54 NOT IN DIRECTORY                 RECORD NUMBER      690
```

14. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT= 55 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 3, MT= 55
         SECTION  3/ 55 NOT IN DIRECTORY                 RECORD NUMBER      702
```

15. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT= 56 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 3, MT= 56
          SECTION  3/ 56 NOT IN DIRECTORY                RECORD NUMBER      713
```

16. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT= 57 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 3, MT= 57
          SECTION  3/ 57 NOT IN DIRECTORY                RECORD NUMBER      723
```

17. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT= 91 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 3, MT= 91
          SECTION  3/ 91 NOT IN DIRECTORY                RECORD NUMBER      733
```

18. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT=102 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 3, MT=102
          SECTION  3/102 NOT IN DIRECTORY                RECORD NUMBER      742
```

19. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT=103 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 3, MT=103
          SECTION  3/103 NOT IN DIRECTORY                RECORD NUMBER      762
```

20. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT=104 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 3, MT=104
          SECTION  3/104 NOT IN DIRECTORY                RECORD NUMBER      777
```

21. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT=105 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 3, MT=105
          SECTION  3/105 NOT IN DIRECTORY                RECORD NUMBER      789
```

22. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT=106 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 3, MT=106
          SECTION  3/106 NOT IN DIRECTORY                RECORD NUMBER      798
```

23. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 3, MT=107 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 3, MT=107
            SECTION  3/107 NOT IN DIRECTORY                RECORD NUMBER     807
```

24. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 4, MT= 2 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 4, MT=  2
            SECTION  4/  2 NOT IN DIRECTORY                RECORD NUMBER     823
```

25. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 4, MT= 16 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 4, MT= 16
            SECTION  4/ 16 NOT IN DIRECTORY                RECORD NUMBER     983
```

26. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 4, MT= 22 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 4, MT= 22
            SECTION  4/ 22 NOT IN DIRECTORY                RECORD NUMBER     994
```

27. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 4, MT= 28 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 4, MT= 28
            SECTION  4/ 28 NOT IN DIRECTORY                RECORD NUMBER    1005
```

28. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 4, MT= 32 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 4, MT= 32
            SECTION  4/ 32 NOT IN DIRECTORY                RECORD NUMBER    1016
```

29. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 4, MT= 51 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 4, MT= 51
            SECTION  4/ 51 NOT IN DIRECTORY                RECORD NUMBER    1027
```

30. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 4, MT= 52 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 4, MT= 52
            SECTION  4/ 52 NOT IN DIRECTORY                RECORD NUMBER    1052
```

31. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 4, MT= 53 (0): Directory (b)

4

```
      ERROR(S) FOUND IN MAT=3834, MF= 4, MT= 53
         SECTION  4/ 53 NOT IN DIRECTORY                    RECORD NUMBER    1077
```

32. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 4, MT= 54 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 4, MT= 54
         SECTION  4/ 54 NOT IN DIRECTORY                    RECORD NUMBER    1100
```

33. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 4, MT= 55 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 4, MT= 55
         SECTION  4/ 55 NOT IN DIRECTORY                    RECORD NUMBER    1123
```

34. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 4, MT= 56 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 4, MT= 56
         SECTION  4/ 56 NOT IN DIRECTORY                    RECORD NUMBER    1146
```

35. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 4, MT= 57 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 4, MT= 57
         SECTION  4/ 57 NOT IN DIRECTORY                    RECORD NUMBER    1169
```

36. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 4, MT= 91 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 4, MT= 91
         SECTION  4/ 91 NOT IN DIRECTORY                    RECORD NUMBER    1192
```

37. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 5, MT= 16 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 5, MT= 16
         SECTION  5/ 16 NOT IN DIRECTORY                    RECORD NUMBER    1216
```

38. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 5, MT= 22 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=3834, MF= 5, MT= 22
         SECTION  5/ 22 NOT IN DIRECTORY                    RECORD NUMBER    1267
```

39. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 5, MT= 28 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 5, MT= 28
            SECTION  5/ 28 NOT IN DIRECTORY                RECORD NUMBER    1391
```

40. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 5, MT= 32 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 5, MT= 32
            SECTION  5/ 32 NOT IN DIRECTORY                RECORD NUMBER    1474
```

41. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=3834, MF= 5, MT= 91 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=3834, MF= 5, MT= 91
            SECTION  5/ 91 NOT IN DIRECTORY                RECORD NUMBER    1504
```

- `psyche` Warnings:

  1. Gamma width not in agreement with PSYCHE's expectations
     FILE 2 / SECTION 151 / ISOTOPE MASS = 87. L = 0 / AT RESONANCE ENERGY 1.26900E+04 EV. THE GAMMA WIDTH 4.30940E-01 DEVIATES TOO MUCH FROM THE AVERAGE 1.27149E-01 (0): Gamma width

```
        FILE  2
           SECTION 151
               ISOTOPE MASS =  87. L =  0
                           AT RESONANCE ENERGY  1.26900E+04 EV. THE GAMMA WIDTH  4.30940E-01 DEVIATES TOO MUCH FROM THE AV
```

  2. Strength function in URR not in agreement with PSYCHE's expectations
     FILE 2 / SECTION 151 / ISOTOPE MASS = 87. L = 1 / STRENGTH FUNCTION IS 7.70234E-02 / STRENGTH FUNCTION 7.70234E-02 / LIES OUTSIDE LIMITS 1.00000E-04 TO 8.00000E-04 (0): URR str. ftn.

```
        FILE  2
           SECTION 151
               ISOTOPE MASS =  87. L =  1
                        STRENGTH FUNCTION IS   7.70234E-02
                                STRENGTH FUNCTION 7.70234E-02
        ... [1 more lines]
```

  3. Non-threshold reaction with Q value differing from PSYCHE's expectations
     FILE 3 / SECTION 103 / THE CALCULATED Q 3.13416E+05 DISSAGREES WITH THE GIVEN Q 5.09259E+05 (0): Iffy Q

```
        FILE  3
           SECTION 103
                   THE CALCULATED Q  3.13416E+05 DISSAGREES WITH THE GIVEN Q  5.09259E+05
```

- `recent` Warnings:

  1. Statistical weight of certain L values were incorrect
     0: RRR goof (a)

```
      Calculate Cross Sections from Resonance Parameters (RECENT 2015-1)
      ===============================================================================
      Retrieval Criteria-----------        MAT
      File 2 Mimimum Cross Section- 1.0000E-10 (Standard Option)
      Reactions with No Background-    Output (Resonance Contribution)
      ... [580 more lines]
```

- fudge-4.0   Warnings:

  1. Missing a channel with a particular angular momenta combination
     resonances / resolved (Error # 1): missingResonanceChannel

     ```
     WARNING: Missing a channel with angular momenta combination L = 0, J = 3.0 and S = 3.0 for "capture"
     WARNING: Missing a channel with angular momenta combination L = 1, J = 3.0 and S = 3.0 for "capture"
     WARNING: Missing a channel with angular momenta combination L = 1, J = 3.0 and S = 4.0 for "capture"
     WARNING: Missing a channel with angular momenta combination L = 1, J = 4.0 and S = 3.0 for "capture"
             ... plus 4 more instances of this message
     ```

  2. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 0: total (Error # 0): CS Sum.

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.37%
     ```

  3. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 1: (z,n) (Error # 0): CS Sum.

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.11%
     ```

- fudge-4.0   Errors:

  1. The spin statistical weights are off, indicating missing channels
     resonances / resolved / MultiLevel_BreitWigner (Error # 0): badSpinStatisticalWeights

     ```
     WARNING: The spin statical weights for L=1 sums to 0.45, but should sum to 3.0.  You have too few channels for r
     ```

  2. Calculated and tabulated Q values disagree.
     reaction label 9: n[multiplicity:'2'] + Sr86 (Error # 0): Q mismatch

     ```
     WARNING: Calculated and tabulated Q-values disagree: -8417027.039810181 eV vs -8.4329e6 eV!
     ```

  3. Calculated and tabulated Q values disagree.
     reaction label 10: n + H1 + Rb86 (Error # 0): Q mismatch

     ```
     WARNING: Calculated and tabulated Q-values disagree: -9411239.819869995 eV vs -9424830. eV!
     ```

  4. Calculated and tabulated Q values disagree.
     reaction label 11: n + H2 + Rb85 (Error # 0): Q mismatch

     ```
     WARNING: Calculated and tabulated Q-values disagree: -15837676.66073608 eV vs -1.57697e7 eV!
     ```

  5. Calculated and tabulated Q values disagree.
     reaction label 12: Sr88 + gamma (Error # 0): Q mismatch

     ```
     WARNING: Calculated and tabulated Q-values disagree: 11123772.62203979 eV vs 1.1113e7 eV!
     ```

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6. Calculated and tabulated Q values disagree.
   reaction label 15: H2 + Rb86_s (Error # 0): Q mismatch

   ```
   WARNING: Calculated and tabulated Q-values disagree: -7186673.718933105 eV vs -7114710. eV!
   ```

- `njoy2012`   Warnings:

  1. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
     groupr...compute self-shielded group-averaged cross-sections (0): GROUPR/conver (0)

     ```
        ---message from conver---cannot do complete particle production for mt= 16
                          only mf4/mf5 provided
     ```

  2. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
     groupr...compute self-shielded group-averaged cross-sections (1): GROUPR/conver (0)

     ```
        ---message from conver---cannot do complete particle production for mt= 22
                          only mf4/mf5 provided
     ```

  3. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
     groupr...compute self-shielded group-averaged cross-sections (2): GROUPR/conver (0)

     ```
        ---message from conver---cannot do complete particle production for mt= 28
                          only mf4/mf5 provided
     ```

  4. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
     groupr...compute self-shielded group-averaged cross-sections (3): GROUPR/conver (0)

     ```
        ---message from conver---cannot do complete particle production for mt= 32
                          only mf4/mf5 provided
     ```

  5. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
     groupr...compute self-shielded group-averaged cross-sections (4): GROUPR/conver (0)

     ```
        ---message from conver---cannot do complete particle production for mt= 91
                          only mf4/mf5 provided
     ```